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**From:** Bill.Diguseppi@ch2m.com [Bill.Diguseppi@ch2m.com]  
**Sent:** 6/24/2016 9:22:39 PM  
**To:** Jimmy.Seow@DER.wa.gov.au; virginia.yingling@state.mn.us  
**CC:** gary.krueger@state.mn.us; Bonnie.Brooks@state.mn.us; jennifer.field@oregonstate.edu; BushC6@michigan.gov; Krasnic, Toni [krasnic.toni@epa.gov]  
**Subject:** RE: Brief inquiry on PFAS Guidance and Regulation - J seow reply  
**Attachments:** removed.txt; CONCAWE PFAS Report.pdf

Just FYI – See attached CONCAWE report on PFASs that was just released. If you are not aware, CONCAWE is a consortium of oil companies in Europe. The report has a fair amount of information, but is still light on remediation and sampling and other topics of importance.

Bill D.

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**From:** Seow, Jimmy [mailto:Jimmy.Seow@DER.wa.gov.au]  
**Sent:** Thursday, June 09, 2016 8:42 PM  
**To:** Diguseppi, Bill/DEN <Bill.Diguseppi@ch2m.com>; virginia.yingling@state.mn.us  
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**Subject:** RE: Brief inquiry on PFAS Guidance and Regulation - J seow reply

Thanks Bill

Just got back to work today from my annual leave with my whole family in Greece Malta Tunisia and yes we did go to Istanbul was in the same area where it was bombed a few days ago. We are very lucky. Belief it or not the owner of the apartment we rented in Athens threw out all her non stick pans which could have PFOA ! after she asked me what I do for a living.

Thanks for your poster info.

The new USEPA drinking water value of 0.07 ug/L is causing much concern in Australia and also the German screening value for blood. See the recent article below.

The Australian is a major newspaper of Australia.

Toxic Defence nightmare fells treechangers

The Australian, Australia by Chris Ray Simon King

09 Jun 2016

General News - page 1 - 1596 words - ID 607475294 - Photo: Yes - Type: News Item - Size: 1070.00cm2

Thousands of people in 18 communities near military airfields across Australia are discovering that toxic firefighting chemicals have poisoned their land and water - and that these chemicals appear more dangerous than authorities have conceded.

Tests to detect perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), which have been linked with cancer, are under way or about to start on properties surrounding the airfields in all mainland states and territories.

The Department of Defence is holding public meetings, letterboxing homes and placing advertisements to advise residents of programs to test for the potential carcinogens.

They are slow to break down, can travel long distances in water and air, and biomagnify up through the food chain.

The 18 "priority one" sites are thought to be the most heavily polluted Defence facilities, the department says. State environmental agencies have already established contamination zones around the Williamstown RAAF base, near Newcastle in NSW, and the Army Aviation Centre at Oakey in southern Queensland.

Declaration of the zones covering an estimated 1200 households has crushed property values, wrecked businesses and left locals fearing for their health.

A new heightened alert from the US Environmental Protection Agency suggests PFOS and PFOA pose greater health risks than Australian environmental and health authorities currently accept. In findings that add to pressure on the Australian government for stronger action to combat the growing pollution scandal, the US agency has drastically lowered its safedinking water level for the contaminants.

The new level of 0.07 micrograms per litre for both chemicals combined is far below the previous US exposure limit of 0.2 micrograms per litre for PFOS and 0.4 micrograms for PFOA.

The US EPA says the "weight of evidence" now supports the conclusion that the chemicals are human health hazards, particularly for the developing fetus and newborn. Exposure could result in testicular and kidney cancer, liver damage, immune suppression, thyroid disease and reduced fertility, it warns.

For Samantha and Jamie Kelly Continued on Page 2

Treechange becomes a nightmare from military's toxic sprays Continued from Page 1 from Sydney, their treechange to Williamstown quickly turned into a nightmare when just after moving, they received a note in their letter box calling them to a "contamination meeting".

What they learnt that September night from a multi-departmental line-up of NSW government experts was that with Samantha six months pregnant, they were now living in the "Red Zone" of pollution caused by the ongoing use of fire fighting chemicals at the Williamstown RAAF base.

"At first they tried to normalise the contaminations, saying they were in everyday products like non-stick frying pans and pop corn bags," Ms Kelly told The Australian. "But quickly it was followed with advice from the NSW Health Department that we weren't to consume the water, any eggs from our chickens, eat any meat products which had consumed the water.

"And that there were some causal effects to cancers in animals - but no studies directing it to a particular health risk in humans. I was six month pregnant - it was shocking, I'd been consuming our eggs and our vegies . it's very scary.

"We wanted a bit of land that was ours, to escape from the city; we moved here for the outdoor lifestyle, and it's been completely destroyed now." What was even more confused was the advice the Kellys were getting about breastfeeding baby William, now five months.

"They were saying it's safe enough for a baby to breastfeed but on the other hand not safe enough for me to eat - it's extremely confusing and distressing," Ms Kelly said.

Rhianna Gorfine, convener of the Williamstown and Surrounds Resident Action Group, accused the federal government of seeking to downplay the seriousness of health impacts in order to limit its legal liability for contamination.

"People here will be really angry if our authorities don't follow the American lead, lower the exposure threshold and provide blood tests for residents who want them," she said.

The Australian government's position, restated by Assistant Defence Minister Michael McCormack following the US warning on May 26, is that there is "no sufficient link" between PFOS/ PFOA and adverse human health effects.

Australian environmental authorities have generally followed the old US water guidelines in the absence of any Australian national standards.

A Defence Department human health risk assessment for Williamtown, due for release at the end of next month, will be based on the now-outdated US standard, Air Vice-Marshal Greg Evans confirmed at a media briefing on Friday.

However, the NSW Environment Protection Authority has sent the US advice to a multiagency expert panel investigating Williamtown contamination and repeated a warning to residents not to use bore water or surface water for drinking or preparing food.

An EPA spokeswoman said the authority would work with Defence to ensure Williamtown residents with water test results above 0.07 micrograms per litre were aware of the new US level.

The revised US exposure level is "potentially devastating" for all 4500 residents of Oakey, which sits on top of an expanding contamination plume, said Peter Shannon of Shine Lawyers, which represents affected locals.

Oakey's entire groundwater supply could be dangerously contaminated, he said.

Residents of the rural town 160km west of Brisbane used bore water for washing, cooking and swimming as well as irrigation and raising livestock.

"Bores which were considered of less concern are all of a sudden of high concern and Defence can no longer hide behind a supposed lack of scientific certainty about health risks," said Mr Shannon.

The Labor Party sought to make PFOS/PFOA pollution a national election issue on Saturday when it promised to establish an intergovernmental taskforce to tackle the contamination.

In pledging to develop "a nationally consistent approach" the opposition's defence spokesman Stephen Conroy also said a Labor government would fund an "initial round" of 10,000 blood tests at affected sites nationwide.

Labor's support for blood tests may boost its prospects in the newly marginal Liberal-held seat of Paterson, which covers Williamtown.

The federal and NSW governments oppose blood tests, which they insist can have no diagnostic or prognostic value.

However, Senator Conroy said blood tests would establish "baseline readings to allow for ongoing monitoring of contaminant exposure".

Government-funded blood testing of affected residents and current and former RAAF base workers was recommended by a Senate foreign affairs, defence and trade references committee inquiry in April.

The inquiry also called for property buyouts for residents and compensation to commercial fishermen hurt by a fishing ban because of contamination of the Hunter River near Williamtown base. The federal government has refused to commit to either measure.

Germany's Commission on Human Biomonitoring announced a PFOS risk-free blood level of five nanograms per millilitre in May. This is far below average levels detected in the blood of a group of 75 Oakey residents tested in a since-abandoned Defence Department program last year.

Oakey male residents tested were on average 17 times above the German "safe" level while the average Oakey woman was 10 times over, said Shine lawyer Rory Ross.

The NSW Health Ministry has advised pregnant women in the Williamstown contamination zone not to stop breastfeeding due to concern about PFOS and PFOA.

The US EPA says developing fetuses and breastfed infants are "particularly sensitive" to PFOS and PFOA-induced toxicity.

A spokeswoman for the federal Health Department said the national Environmental Health Standing Committee was working to set national guidelines for PFOS and PFOA in food, drinking water and surface water used for recreation.

Military air bases, civil airports and fire brigades used firefighting foams containing PFOS and PFOA from the 1970s until they were phased out several years ago.

Airservices Australia says contamination is confirmed or suspected at 36 civil airfields.

Interim test results at Gold Coast airport show "low" levels of PFOS/PFOA pollution, airport chief executive Marion Charlton said yesterday.

Of the 18 "priority-one" military bases, testing has begun at Wagga RAAF base in the Riverina and is expected to start soon at Richmond RAAF base north of Sydney.

At the naval air station HMAS Albatross on the NSW South Coast, base commander Captain Simon Bateman promised residents that testing would be "open and transparent" - and a public meeting heard how firefighters on the base used toxic foam to wash cars and dishes.

In Queensland, investigations are under way at the Townsville RAAF base, which drains to the Great Barrier Reef, and will start soon around Amberley air base on the outskirts of Ipswich.

Defence expects its investigation at East Sale RAAF base in Victoria to continue for 12 months.

The department has letterboxed households in the outer Perth suburb of Bullsbrook advising them that bore water sampling on private land is under way close to RAAF base Pearce.

Initial tests at Edinburgh RAAF base in South Australia are due to finish by the end of next month. The Northern Territory Environment Protection Authority has reported "concerning levels" of PFOS and PFOA in suburban creeks around Darwin RAAF base while preliminary testing at RAAF base Tindal near Katherine is scheduled to be completed this month.

DANGER SITES NSW: RAAF Base Williamstown HMAS Albatross RAAF Base Richmond RAAF Base Wagga Holsworthy Barracks HMAS Stirling Garden Island Queensland: Army Aviation Centre Oakey RAAF Base Townsville RAAF Base Amberley Victoria: RAAF Base East Sale Bandiana Military Area HMAS Cerberus Western Australia: RAAF Base Pearce South Australia: RAAF Base Edinburgh Northern Territory: RAAF Base Tindal RAAF Base Darwin Robertson Barracks ACT: HMAS Creswell/Jervis Bay Range Facility

Caption Text:

BRITTA CAMPION Samantha and Jamie Kelly with baby William on contaminated property behind their home at Williamstown, north of Newcastle in NSW

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**From:** Bill.Diguseppi@ch2m.com [<mailto:Bill.Diguseppi@ch2m.com>]

**Sent:** Thursday, 2 June 2016 11:29 PM

**To:** [virginia.yingling@state.mn.us](mailto:virginia.yingling@state.mn.us); Seow, Jimmy

**Cc:** [gary.krueger@state.mn.us](mailto:gary.krueger@state.mn.us); [Bonnie.Brooks@state.mn.us](mailto:Bonnie.Brooks@state.mn.us); [jennifer.field@oregonstate.edu](mailto:jennifer.field@oregonstate.edu); [BushC6@michigan.gov](mailto:BushC6@michigan.gov); [Krasnic.Toni@epamail.epa.gov](mailto:Krasnic.Toni@epamail.epa.gov)

**Subject:** RE: Brief inquiry on PFAS Guidance and Regulation - J seow reply

Thanks to all who provided information in support of my poster at Battelle. This was certainly a hot topic amongst facility owners, regulators, technology vendors, and consultants. As promised I am providing my poster, as well as a colleague's presentation, which contains some of the same information, but adds more media and comes from a risk assessment point of view (and is more visually appealing).

If anyone becomes aware of new regulation in this arena (Like NH's new rule:

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what I might come across.

Bill D.

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**From:** Yingling, Virginia (MDH) [<mailto:virginia.yingling@state.mn.us>]

**Sent:** Thursday, April 07, 2016 7:42 AM

**To:** Seow, Jimmy <[Jimmy.Seow@DER.wa.gov.au](mailto:Jimmy.Seow@DER.wa.gov.au)>; Diguseppi, Bill/DEN <[Bill.Diguseppi@ch2m.com](mailto:Bill.Diguseppi@ch2m.com)>

**Cc:** Krueger, Gary (MPCA) <[gary.krueger@state.mn.us](mailto:gary.krueger@state.mn.us)>; Brooks, Bonnie (MPCA) <[Bonnie.Brooks@state.mn.us](mailto:Bonnie.Brooks@state.mn.us)>; Field, Jennifer <[jennifer.field@oregonstate.edu](mailto:jennifer.field@oregonstate.edu)>; Bush, Christina Rose (DCH) <[BushC6@michigan.gov](mailto:BushC6@michigan.gov)>;

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**Subject:** RE: Brief inquiry on PFAS Guidance and Regulation - J seow reply

Just a quick note – Minnesota has used additivity calculations for many years when we have mixtures of chemicals with similar modes of action and target organs. It's essentially a TEQ calculation:

$C_x/HRL_x + C_y/HRL_y + C_z/HRL_z \dots = HI$

Where C = concentration; HRL = Health Risk Limit; HI = hazard index (x, y, z are the various chemicals detected)

If HI > 1, this is considered to be an exceedance just as if an individual chemical had exceeded its HRL.

Ginny Yingling

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**From:** Seow, Jimmy [<mailto:Jimmy.Seow@DER.wa.gov.au>]

**Sent:** Thursday, April 07, 2016 12:58 AM

**To:** [Bill.Diguseppi@ch2m.com](mailto:Bill.Diguseppi@ch2m.com); Yingling, Virginia (MDH) <[virginia.yingling@state.mn.us](mailto:virginia.yingling@state.mn.us)>

**Cc:** Krueger, Gary (MPCA) <[gary.krueger@state.mn.us](mailto:gary.krueger@state.mn.us)>; Brooks, Bonnie (MPCA) <[Bonnie.Brooks@state.mn.us](mailto:Bonnie.Brooks@state.mn.us)>; Field, Jennifer <[jennifer.field@oregonstate.edu](mailto:jennifer.field@oregonstate.edu)>; Bush, Christina Rose (DCH) <[BushC6@michigan.gov](mailto:BushC6@michigan.gov)>; [Krasnic.Toni@epamail.epa.gov](mailto:Krasnic.Toni@epamail.epa.gov)

**Subject:** RE: Brief inquiry on PFAS Guidance and Regulation - J seow reply

Dear Bill and Virginia

How are you all

Thanks for updating me.

May I update you all on what I know as we all working in the same space

USEPA revised Provisional Drinking Water Values

Like you I am also awaiting their final report as I am led to believe there is already a draft however I could not convince Dr Joyce Donohue USEPA officer in charge of that revision project to hint to me of their revised values which is fair enough. Rumours it could be 100 times lower but I think it came about from Grandjean and Clapp 2015 paper recommending that lowering. I did ask Dr Joyce about that rumour and she said it is a rumour and said no more. Your mentioned values of 0.1 ug/L is interesting but we still do not know until USEPA release its values. Many are awaiting for it but not wanting to be rude to the US I think the US has now been superseded by EU direction of 0.65 ng/L PFOS for surface water by the Danish and now adopted as a directive by EU in September 2015 and conformed by my Norwegian contact that Norway will also take that position. So is Germany and Sweden anecdotally advised. I am awaiting what does that really mean in terms of regulation ie is that directive now policy or guidelines or will be embedded as regulation all three will have different implications for end users. Norway has yet to reply to my quest for clarification.

I see Bonnie name in the email list and am sure you all aware of MPCA interim values for soil PFOA and PFOS which are much lower than the USEPA.

#### Combination of PFOS + PFOA + PHxS approach

Interesting to note that the US may or will also take that direction which Sweden took as they have 7 PFC combined to be less than 0.9 ug/L (in which PFHxS is included) and they added in 6:2 FTS what I call 7 + 1 policy. Their published for PFOS and PFOA guidelines are 0.9 ug/L before the EU directive and I am also awaiting their new position how that now work with EU guidelines values as mentioned above. It seems we are all in the state of flux.

#### Australia

Last month CRC Care (a Commonwealth funded organisation for research in various fields) released its proposed values which was much debated with no consensus yet. Having said that the Australian Commonwealth (Federal) Dept of Environment released guidelines for contaminated sites assessment for water for PFOS and PFOA based upon ecological risks (see attached) which I can now share with you. The process forward is that the Commonwealth will then consult with all states on the two proposed guidelines and I don't believe that process has started. My department Contaminated Site branch recently came up with an interim policy for soil and groundwater contaminated with PFC and now in public consultation (I am not in Contaminated Sites Branch but did give them my recommendation and opinion for their consideration).

EnHealth which is a Commonwealth body for health in conjunction with state Department of Health as we speak is coming up with guidelines for PFOS and PFOA health values such as TDI. Don't have the draft yet to share.

#### Are we are still in the state of flux

I think so. Hey we are not yet even dealing with fluorotelomers environmental and health values yet. Hmmm. Attempts as mentioned above made by Sweden the 7 + 1 approach (been silly it is like the Swedish Abba group singing Mama mia here we go again ma ma).

Interesting times may I say.

Kindly keep me in the loop

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**From:** Bill.Diguseppi@ch2m.com [mailto:Bill.Diguseppi@ch2m.com]  
**Sent:** Thursday, 7 April 2016 1:41 AM  
**To:** virginia.yingling@state.mn.us  
**Cc:** gary.krueger@state.mn.us; Bonnie.Brooks@state.mn.us; Seow, Jimmy  
**Subject:** RE: Brief inquiry on PFAS Guidance and Regulation

One EPA person I asked said we should see the revised Health Advisory levels in the next few weeks, but of course we've heard that before. And the Hoosick Falls EPA Press Release to not drink the water above 0.1 ug/L pretty much reveals where they are going.

But another potential direction I've heard is that EPA will suggest (? Or require?) a hazard quotient approach, where the sum of PFOA and PFOS should not exceed 0.1 ug/L. So effectively making the standard 0.05 ug/L. And I understand that Region 8 sr. risk assessor also suggested to CDPHE that they apply the 0.1 ug/L standard to PFHxS as well. Not sure if any or all of this will come out with the final Health Advisories, but it'll be interesting to see how combinations or other PFASs beyond PFOA and PFOS will be addressed.

Yes, my next inquiry was heading to Dr. Seow to see if he's heard anything new.

Thanks for your input.

Bill D.

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**From:** Yingling, Virginia (MDH) [mailto:virginia.yingling@state.mn.us]  
**Sent:** Wednesday, April 06, 2016 10:29 AM  
**To:** Diguseppi, Bill/DEN <Bill.Diguseppi@ch2m.com>  
**Cc:** Krueger, Gary (MPCA) <gary.krueger@state.mn.us>; Brooks, Bonnie (MPCA) <Bonnie.Brooks@state.mn.us>; Seow, Jimmy <Jimmy.Seow@DER.wa.gov.au>  
**Subject:** RE: Brief inquiry on PFAS Guidance and Regulation

Hi Bill:

Minnesota has a division of labor on some of this – regulatory responsibility is under the purview of the MN Pollution Control Agency (MPCA). I'm cc'ing Gary Krueger as he may be able to respond to your first two questions about regulations and guidance for PFAS and AFFFs.

Regarding guidance values in various environmental media, Minnesota has the following values:

GROUNDWATER: Health Risk Limits (HRLs):

PFOS = 0.3 ug/L

PFOA = 0.2 ug/L

PFBA = 7 ug/L

PFBS = 7 ug/L

[<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcshealth.html>]

We are also using the PFOS value of 0.3 ug/L as a "surrogate" value for PFHxS on an interim basis while awaiting the results of some EPA and 3M studies. We hope those will provide enough information to allow us to derive a Health Based Value (HBV) for PFHxS, which is essentially the same as an HRL, but not promulgated through rule-making.

FISH (PFOS only):

<= 40 ppb: unrestricted consumption

>40 – 200 ppb: 1 meal/week



> 200 – 800 ppb: 1 meal/month

>800 ppb: do not eat

[<http://www.health.state.mn.us/divs/eh/fish/eating/mealadvicetables.pdf> ]

SOIL (Soil Reference Values, or SRVs):

PFBA: 77 mg/kg - residential; 94 mg/kg – recreational; 500 mg/kg - industrial

PFOS: 2.1 mg/kg - residential; 2.5 mg/kg – recreational; 13 mg/kg - industrial

PFOA: 2.1 mg/kg - residential; 2.6 mg/kg – recreational; 14 mg/kg - industrial

[NOTE – MPCA is currently evaluating revised SRVs for PFBA, PFBS, PFOS, and PFOA – I'd suggest contacting Gary Krueger or Bonnie Brooks (both cc'd on this) for more info]

SURFACE WATER:

PFOS: 7 ng/L – Mississippi River, Pool 2; 6.1 ng/L – Lake Calhoun, Minneapolis

PFOA: 720 ng/L – Mississippi River, Pool 2; 610 ng/L – Lake Calhoun, Minneapolis

PFBA: 1,000 ng/L – statewide

You can certainly cite all of the values I provided as being from Minnesota – it's all public information and on our websites (if you can find the right page). I've provided the links for the MDH groundwater and fish values.

If you haven't already, I'd suggest contacting Dr. Jimmy Seow in Australia. He's been compiling a lot of this information and might be able to save you a lot of time.

As you probably know, EPA keeps rumbling about releasing new PFOA and PFOS Lifetime Health Advisory values this spring. Not sure when/if this will happen.

I've cc'd all the folks I mentioned in this email so you have their contact info.

Good luck!

Ginny Yingling

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**From:** Bill.Diguseppi@ch2m.com [mailto:Bill.Diguseppi@ch2m.com]

**Sent:** Tuesday, April 05, 2016 5:40 PM

**To:** Bill.Diguseppi@ch2m.com

**Subject:** Brief inquiry on PFAS Guidance and Regulation

Hello – I note that you attended the Emerging Contaminants Summit held last month in Westminster, Colorado. That attendance suggests some level of interest or knowledge in terms of emerging contaminants. I hope that your interest includes per- and polyfluoroalkyl substances (PFAS) (e.g., perfluorooctane sulfonate – PFOS, perfluorooctanoic acid – PFOA, etc.) found in aqueous film forming foam (AFFF). I too have interest and knowledge in this arena and am presenting a poster titled: “*A Survey of International Regulation and Operational Guidance Related to Aqueous Film Forming Foams and Per- and Polyfluoroalkyl Substances (PFASs)*” at the upcoming Battelle Recalcitrant Compounds Conference in late May in Palm Springs, CA. I have a fair amount of information/documentation already but wanted to gather just a little more, especially more up-to-date information, regarding guidance or regulation on the manufacture, procurement, usage and disposal of PFASs and AFFF. If you have a moment, I would really appreciate if you answered the following few questions so that I could compile information representing a broad variety of government jurisdictions. If you would not want to be mentioned by name or agency, please let me know and I would like to use your information in the aggregate with no reference to source. Otherwise, I might want to make specific reference to one or more of your responses.

1. Does your organization have guidance or regulate the manufacture or disposal of PFASs or AFFF?
2. Does your organization have guidance or regulate the use of AFFF?
3. Does your organization have guidance or regulate PFAS (e.g., PFOS, PFOA, etc.) impacts to soil or groundwater?
4. If you have guidance or regulation for PFASs in soil or groundwater, what compounds are regulated and at what levels?
5. If you do not presently have guidance or regulation for PFASs, are there any in progress that you foresee being issued by your organization in the next 2 years?

If the answer to any of these questions is positive, please provide reference document titles or web links.

I will distribute the finished poster to all who contribute, hopefully you find it useful.

I thank you in advance for your time and attention to this compilation.

Bill DiGuseppi  
Global Emerging Contaminants Leader

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